THE CHOICE OF OPERATIVE METHOD FOR THE REMOVAL OF THE HYPERTROPHIED PROSTATE.

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THE satisfactory establishment of surgical efforts for the radical removal of urinary obstruction, caused by enlargements of the prostate gland, must be accepted as now thoroughly accomplished.

It is of interest to note, in surveying the literature of the subject, that among the many different methods of attacking the prostate that have been proposed by different surgeons, practically equally good results are reported to have been secured by the most diverse methods by men who had become specially skilled in their application. It cannot be, however, that the choice of a method is a matter of indifference, a question of chance or prejudice. In view of the frequency of the malady—every hamlet has its prostatics; wherever there are old men obstructive dysuria will be met with—the general recognition of the possibilities of operative relief will compel the frequent attempt on the part of the general surgeon to supply it. So that the question is no longer what is possible in the hands of the specially expert, but what, in the light of our present knowledge of the anatomical relations and the pathological changes of the prostate gland, will in the hands of the average surgeon most certainly and safely, wholly and permanently, relieve the obstructive dysuria that the prostatic disease has produced.

The question of *mortality* naturally takes precedence in the consideration of any operative proposition. There must of necessity be some mortality in any and every kind of surgical intervention in prostatic patients. Sepsis, renal insufficiency, and the multiple degenerations incident to old age are complications in varying degrees of combination, that have to be reckoned with in many instances, and which must determine a fatal exit inevitably in a certain proportion. The proper selection of cases and the due preparation of them for the hazards of operation will always engage the earnest attention of the surgeon, and by these means the rate of mortality will be kept at a minimum. With the demonstration of the comparative safety and certain benefits of operation will come a resort to it much earlier in the course of the disease than has hitherto been the case, with which will come a marked diminution in its hazards and a corresponding lowering of its death-rate.

It has not failed of notice that total removals of the gland, by whatever method, have been attended by a smaller mortality than have partial removals of obstructing parts. In other words, the wider open the door which has been left for the free exit of infective materials, the greater the freedom from subsequent septic complications. In this matter of drainage, as in all other precautions which pertain to serious surgery in any part of the body, operations upon the prostate are governed by the well-established dicta of general surgery.

At present, it would seem that a surgeon must expect a death-rate after prostatectomy of from 5 to 10 per cent. While he may in some instances possibly have the good fortune to have a considerable series of cases without a death, yet a longer continuance of work has been found even in the experience of the most careful and fortunate to be attended with a share of mortality.*

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* The following recent statistics are of interest as examples of unusual immunity from mortality: *Small median perineal incision; finger enucleation unaided by sight:* Goodfellow, 78 cases, 2 deaths; Murphy, 51 cases, 1 death; Syms, 33 cases, 2 deaths. *Free transverse perineal incision; visual control of enucleation by finger and instruments:* Young, 75 cases, 4 deaths; Albarran, 59 cases, 2 deaths; Hartmann, 36 cases, 2 deaths; Proust, 30 cases, 0 deaths; Pauchet, 20 cases, 1 death; Rafin, 20 cases, 1 death. *Total enucleation by finger unaided by sight through suprapubic opening in bladder:* Freyer, 107 cases, 5 deaths.

Expectation of Cure.—Second only to the question of mortality is that of expectation of cure. The primary indication is the re-establishment of the ability of the individual to readily, fully, and painlessly evacuate his bladder. With regard to the restoration of normal function it must not be forgotten that the statements both of patients and of surgeons should always be considered as relative. Prepossession and enthusiasm often lend a rose color to the reports of results, and a more close scrutiny of real conditions may often elicit information as to attendant infirmities which really modify the result. Nevertheless, even with these modifications, the fulfilment of the supreme indication, viz., the removal of the urinary obstruction, is a sufficient achievement to obscure the presence of many lesser evils. With these reservations, the accumulated experience of the past ten years is that in more than 60 per cent. of the cases that have been subjected to total prostatectomy, the ability to empty the bladder spontaneously has been restored, and has been maintained permanently, so that the use of a catheter has been no longer necessary; there was but little, if any, residual urine, and the quality of the urine has become fairly normal. Coincidently, the general health has greatly improved. In a very large proportion of the remaining cases a marked improvement to the obstructive symptoms has resulted; the amount of residual urine has decreased; the intensity of the cystitis has diminished, and the frequency of catheterism has been lessened, and the facility of passing the instrument has been increased.

The infirmities which claim acknowledgment as possibly frequently modifying the perfection of the result are, *Impotence, Urinary Incontinence, Epididymitis* and *Orchitis, Fistulæ, Stricture of the Urethra.*

I. *Impotence.*—The removal of the posterior central segment of the prostate through which the ejaculatory ducts pass on their way to their openings of discharge into the prostatic urethra necessarily carries with it a greater or less extent of these ducts, and entails the later cicatricial obliteration of the duct stumps left behind. It is obvious that in attacks upon those forms of obstructive overgrowth in which middle lobe hypertrophy is a determining factor, such injury to the ejaculatory ducts is very probable, and often inevitable, except when special precautions are taken to preserve them.

The experience of surgeons in operative attacks on the prostate thus far has shown, however, that in a very considerable proportion of cases that come to operation, the obstruction is not due to large median tumors. In my own work, of twenty-three cases thus far operated on, in but eight of the entire number was the hypertrophy attended with marked median enlargement. In eight of them the lateral lobes were chiefly and but moderately enlarged, and in the remaining seven the prostatic overgrowth was of the hard, firm, fibrous variety.

The practical bearing of this observation upon the subject of inquiry is this, that in the denser specimens of such prostates not at all, and in the mixed forms only to a limited degree is enucleation of tumor masses possible, and their removal is best accomplished by systematic dissection or morcellement with the help of forceps and scissors; and if it is possible to so direct these procedures as to spare the posterior central ejaculatory ducts bearing segment, the likelihood of the production of impotence as a consequence of the operation would be lessened.

Horwitz,* however, has advanced the theory that impotence may follow prostatectomy independently of any wound or resection of the ejaculatory ducts, due to the disturbance of the important nervous mechanism of the gland by the operative injury inflicted on the gland as a whole. He calls attention to the fact that cases are constantly met with of chronic disease of the prostate in which sexual debility is a marked symptom, in which the ejaculatory ducts and seminal vesicles are healthy. His conclusion is that any surgical interference with the prostate gland in men of advanced years, whose sexual vigor is already either on the decline or in abeyance, would be likely to result in sexual exhaustion. While it is true that prostatic dysuria is more frequently met with in men in whom, by reason of their age, sexual vigor is in the decline or is already merely a memory, nevertheless the instances are not infrequent in which the disease develops at an age when virility is still well preserved. The question of impotence, caused by operation, must loom up large to such a man when called upon to decide whether he shall submit to a prostatectomy or shall enter upon or continue a catheter life. When, however, the catheter life has come to its inevitable end, and the question is simply one of the preservation of life and the obtaining relief from an intolerable suffering, then the question of impotence or of other mere infirmities becomes insignificant.

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* Horwitz. Radical Cure of Senile Hypertrophy of the Prostate Gland. New York Medical Journal, 1904, August 6, 13, and 20. Reprint, p. 30.

In the case of men still possessing fair sexual vigor, it is evident that the surgeon, keeping in view always the prime indication for the full and absolute removal of obstruction, so as to ensure a permanent ability to spontaneously empty the bladder, should adopt an operative technique that will avoid as far as possible injury to the ejaculatory ducts. While in many cases this will be impossible, and they must be swept away in the fulfilment of more imperative indications; while in yet others the damage to the sexual apparatus, independent of the continuity of the seminal ducts, may so disturb the possibilities of erection and intromission as to produce a condition of practical impotence; there yet remains a very considerable proportion of cases in which the preservation of sexual vigor is to be expected, as the result of the adoption of suitable methods of operative technique.

Urinary Incontinence in some degree is an occasional result of prostatectomy, whatever the operative method employed. Some defect in the ability to retain urine in the bladder is to be expected during the first weeks after operation. As a rule, however, after a few weeks, or months at farthest, complete control over the bladder is regained. In a small proportion of cases some lack of control persists indefinitely, causing urinary leakage when moving about, or at times when asleep, or whenever the bladder becomes somewhat distended, or when the individual is fatigued. It is impossible as yet to secure reliable data on sufficiently large scale to permit of the formulation of percentage calculations of any value as to the relative frequency with which permanent incontinence in some degree follows the operation. It is, however, an infirmity which is of little magnitude by the side of the serious malady for which it has been substituted.

Epididymitis and Orchitis frequently develop in the early aftercourse of cases of prostatectomy, as the result of infection transmitted from the prostatic site. It not infrequently is immediately excited by the passage of sounds after the removal of the primary drainage-tubes, but it may also arise without the intervention of any such instrumentation. In my own twenty-three cases this complication has appeared in six instances. It is usually slight in degree and unimportant in its relation to the convalescence; but in two of my cases it went on to suppuration.

Fistulæ.—Suprapubic fistulæ, perineal fistulæ, and recto-urethral fistulæ are among the occasional sequelæ of operation for the removal of the prostate. They occur with sufficient frequency to make their mention necessary in any complete consideration of the subject of prostatectomy, but yet so rarely as to have very little practical bearing on the prognosis of a given case. In the absence of great loss of substance in the original wound, the failure of a suprapubic or perineal opening to close is usually due to some contraction in the anterior urethra, and, as a part of the cares in any given case, the surgeon should secure perfect freedom of the urethral lumen throughout its whole extent.

Recto-urethral fistulæ may result either from an accidental tear through the anterior wall of the rectum in the course of the efforts to expose the prostate or from later sloughing consequent upon intense local infection, or from drainage-tube, or tampon pressure. The very close relation of the prostate and the rectum at once suggests the difficulty of separating them without injury to the rectum, and the possibility of such injury doubtless had much to do in discouraging earlier

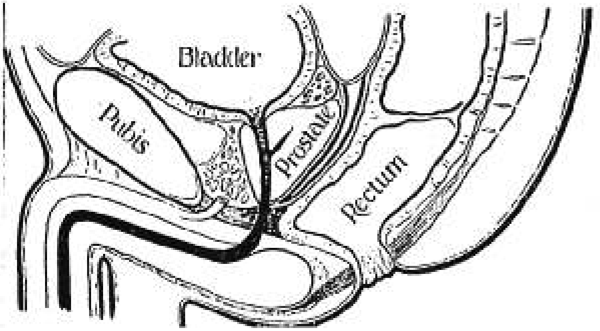

FIG. 1.—Diagram to illustrate surgical relations of prostate to rectum and perineum. (Modified from Proust.) Note especially the space between anterior wall of rectum and interior surface of prostate; note the drawing of the suprasphincture part of the anterior wall of the rectum towards the urethra and pubis by the recto-urethralis muscular fibres; note the projection into the perineum of the bulk of the corpus spongiosum penis.

attempts on any general scale to attack the prostate. Fortunately, however, between the capsule of the prostate and the underlying musculofibrous external coat of the rectum there is an appreciable layer of loose connective tissue which forms a line of easy cleavage, so (Fig. 1) that when once the capsule of the prostate has been exposed, the further stripping back of the rectum to any degree that may be necessary is comparatively free from danger of injury to the rectum. It is that portion of the rectum which is anterior to the prostate, and which is pulled forward towards the membranous urethra by the recto-urethralis muscular fibres, which is most likely to be the seat of injury when the prostate is approached from the perineum. With care and due attention to the anatomical relations of the structures involved, this point of danger may usually be avoided; but it is quite conceivable that in occasional instances the relations and texture of the perineal structures may be so altered by fibrotic or inflammatory changes as to make the desired detachment and pushing back of the rectum without injury very difficult to accomplish. That such injury has occurred at the hands of many able surgeons is a matter of record, and it is not unreasonable to believe that not all the instances in which it has occurred have been published.

In my own earlier experience such injury to the rectum occurred twice as the result of misadventure in the course of the effort to expose the prostate, both times in cases of small fibrotic prostates with increased rigidity of the recto-urethral muscular mass. In a third case an opening into the rectum occurred fourteen days after operation, as the result of a slough due to wound infection. In two of these cases the fistula was subsequently completely repaired by plastic operation; in the third case, a plastic failed to close the fistula and, other circumstances having prevented its repetition, the fistula persisted, during the remaining two and a half years during which his life was prolonged, about two-thirds of the urine passing into the rectum at each urination, requiring the man to sit upon the stool to void it.

Urethral Stricture does not seem to have followed to any serious degree the extensive lacerations and removals of the prostatic urethra which have marked many of the operations upon the prostate. It has been frequently the case that the entire prostatic urethra has been taken away with no subsequent disturbance of the urinary functions. Extensive tearing away of the prostatic urethra has accompanied, certainly in some, and probably in most, if not all, the extensive enucleations done by the suprapubic route; a varying degree of injury to the floor and lateral walls of the prostatic urethra attends most of the perineal methods of operation. The claims of many operators, who remove prostatic masses guided by the sense of touch alone, that very limited injury of the urethra results from their manipulations, are not sustained by our knowledge of the anatomical conditions of the parts. The urethra in its course through the prostate does not present such distinct layers in its walls as are found in its membranous and penile portions; nor does it present any such recognizable layers as does the capsule of the gland from which the adenomatous masses of an enlarged organ can be readily peeled away. It consists of a few layers of columnar epithelium resting on a base composed of connective tissue and muscular fibres which are directly continuous with the stroma of the gland itself, and surround and support likewise the score and more of ducts to which the primary lobule outlets converge, and which open upon the floor of the urethra, and which also are lined by an extension of the urethral epithelium. (See Fig. 4, page 484.) In other words, the submucous and muscular coats belonging to the urethra in other parts of its course are here replaced by prostatic substance. It seems to the writer that the laceration of the urethral wall by attempts to tear out more or less of the glandular substance external to it can be prevented only by the most careful and delicate manipulation, conducted in full view and with the assistance of careful dissection as the enucleation approaches the vicinity of the urethral wall. The periphery of these prostatic masses can readily be enucleated from the capsule with a blunt dissector or with the finger-tip; but upon the urethral side of the mass the condition is different. They can be readily torn away, it is true;

but the operator who thinks that in effecting this he leaves the prostatic urethra intact is probably mistaken. More emphatically is this the case in the presence of the hard fibrous prostate.

It may be well, therefore, to accept as one of the usual accompaniments of prostatectomy, as a surgical procedure, a very considerable laceration and loss of substance of the prostatic urethra. In view of this, the fact of its regeneration becomes one of considerable surgical interest. When the roof and a considerable portion of its lateral wall is left after the enucleation is completed, it is natural to expect that the conditions suffice to insure a patent mucous-lined canal as wound-healing progresses; in those other cases in which nearly complete enucleation of the whole gland *en masse*, bringing with it a considerable segment of the whole circumference of the urethra, is effected by attack from within the bladder there remains an irregular, but in general a funnel-shaped, cavity, into which the bladder mucosa must prolapse, and as the process of repair progresses furnishes an advancing line of epithelium to cover any raw surface still present. From the end of the membranous urethra likewise a similar epithelial ingrowth may contribute to the ultimate result; from the ducts and lumina of any of the gland substance that may have escaped the surgical attack an additional source of epithelium may be presented. This may explain why the possibility of speedy regeneration of an adequate epithelium-lined canal through the eviscerated prostate has been demonstrated by abundant clinical experience. The very natural apprehension, entertained by many, that intractable stricture would be a common sequel to these operations has not been realized. In order to secure this immunity from later stricture, it would seem that the urethral lesions must be restricted to the prostatic portion of the urethra. It would seem also a sound surgical procedure in all cases to place a good-sized rubber drainage-tube into the bladder through the prostatic hiatus during the early days after operation, to be replaced later, possibly for a week or more, by a catheter á demeure; this, in addition to the advantages of drainage, for the purpose of favoring and controlling the formation of a suitable channel, along which the process of epithelial proliferation shall extend. The occasional use of a full-sized sound may be adopted as a substitute or a succedaneum to the catheter for a time in the after-history of such a case.

Indications for Operation.—In the preceding observations the attempt has been made to make as full and just a statement as present experience allows of the expectation of life and degree of cure in cases of prostatic dysuria properly to be expected from the various methods of removal of the obstructing masses. In view of the results narrated, it would be impossible to overstate the magnitude of the benefits which direct surgical attack now offers, remembering the frequency of the complaint, the suffering and disability imposed by it, and the certain disastrous ending to its palliation by catheterism. In adding this latter observation as to the perils of catheterism, the writer desires to avoid exaggeration. It is granted that in many instances for a prolonged period the habitual use of a catheter is well tolerated, in some instances by reason of scrupulous attention to asepsis in its use, but more frequently as a result of a special immunity against bladder infection possessed by the individual; but even in the most resistant of individuals cystitis sooner or later develops, and with this the whole train of symptoms and conditions which are included under the term of *prostatism.* Notorious is the liability of such catheter subjects to attacks of prostatic congestion, whereby the possibility of the facile introduction of the instrument is destroyed for the time, and the sufferings and dangers of acute complete retention of urine are precipitated.

It has long been recognized that the degree of obstruction bears no necessary relation to the size of the prostatic enlargement. Senile degeneration of the bladder wall, lessening the expulsive power of the bladder, may be an important factor in the final breakdown. This may be, and often is, associated with fibrotic contracture at the neck of the bladder, lessening the facility with which it relaxes to permit the outflow of urine, and thus disturbing the balance of the expulsive mechanism of the bladder and leading to the development of pouching of the bas-fond and the formation of a retroprostatic lip or bar. As a part of this process, the prostate also presents a relative increase in its fibrous elements, with or without glandular increase, and adds its element of obstruction to the complex of conditions. Whatever the special condition present, the dominating feature of all these cases is *urinary obstruction*. Whenever this is present to a degree that materially interferes with the comfort of the individual, or entails notable disability; if examination shows that the bladder never wholly empties itself, and especially when crises of complete retention have occurred, all of which are reasonably traceable to prostatic obstruction, then it would seem as if indications enough had been presented to justify resort to prostatectomy.

Shall not the use of the catheter first be tried? Certainly as a temporary resort, but in the light of present experience always rather under protest than as a measure possessing the full recommendation of the surgeon.

Doubtless in many cases operation on the first appearance of serious obstructive symptoms will be impracticable, either through the disinclination of the patient to submit to such an operation as prostatectomy, or his inability to give up from his occupation the time required for its performance and recovery thereupon, provided the use of the catheter is found to be unattended with any special trouble or discomfort; nevertheless, it is impossible to emphasize too much the great difference in the risks, both as regards danger to life and probable perfection of cure, of operations done early before the inevitable bladder, ureteral, and kidney infections have developed, the sure ultimate consequences of the use of the catheter, and of those which have to be done as a last resort in the presence of some or all of these conditions.

The particular indication for prostatectomy to-day, therefore, is a degree of urinary obstruction that interferes materially with comfort or entails notable disability, which examination demonstrates with reasonable certainty to be due to enlargement of the prostate or to fibrotic changes in its texture.

Prostatic dysuria declared, the question of contraindications to operation must rather be the ones for consideration, if such exist, which may outweigh or modify the primarily dominating indication.

Great age, if with it catheterization be facile and comfortable, might properly be a reason for resort to the catheter during the brief period of life remaining, rather than subject the patient to the special immediate hazards of operation.

Great age, however, is a very relative term; many men are older at seventy than others at eighty. Septuagenarians and octogenarians often bear operations well, if they are not subjected to too much loss of blood, and are soon gotten out of bed. In my own experience, one of the most satisfactory results was obtained in a gentleman of eighty-four years, from whom a median and unilateral mass weighing two and a half ounces was enucleated. Twice I have removed the prostate from men of seventy-eight years with happy issue. In eight other cases, whose ages ranged from seventy-one to seventy-four years (seventy-one, seventy-two, seventy-two, seventy-two, seventy-two, seventy-three, seventy-three, seventy-four), the course of recovery has been equally smooth, with the exception of one case in which death quickly followed operation from postoperative pulmonary congestion. On the other hand, the only other death in the whole series was in the person of the youngest patient of all, a man fifty-seven years of age, who died uræmic on the seventh day after operation.

Advanced kidney lesions are the most frequent conditions that may contraindicate any serious operative procedure, requiring the surgeon to be content with the continued use of the catheter, if practicable, or, if not, with a rapidly executed suprapubic section for drainage, under cocaine.

Profound general depression resulting from prolonged suffering, loss of sleep, and septic absorption may contraindicate prostatectomy. In some cases a proper combination of drainage, perineal or suprapubic, with bladder irrigations, the removal of calculi, if present, urinary antisepsis, sedatives, and general hygiene, may so improve the general and local state of such patients as to make later prostatectomy possible and curative.

Any of the conditions of the other organs or of the general state of the body which are recognized by surgeons in general as contraindications to operations must be taken into the account when considering the surgery of the prostate, and given that weight which all the circumstances indicate.

TREATMENT PRELIMINARY TO OPERATION.—Prostatectomy is not an operation of emergency, and should be preceded in all cases by those general cares accepted in all serious surgical work as desirable to secure the best state of bodily vigor. Sleep should be secured by opiates, if needed. The digestive tract should be cleansed and regulated by suitable aperients and diet; the kidneys should be flushed by copious draughts of water; the skin should be depurated and cleansed by hot baths; the bladder should be drained by a retained catheter and its mucous membrane treated by accepted methods. The urine should be made antiseptic by the administration of urotropin in half-gramme (7½ grains) doses four times daily. The rectum should finally be emptied by an enema administered nine or ten hours before the hour set for the operation.

Whether cystoscopic examinations of the bladder shall be made or not will depend very much on the habit and personal prepossession of the surgeon. It is denounced by many operators as an unnecessary tax upon the endurance of the patient, liable to aggravate the local prostatic and bladder irritation, and giving no information that cannot be better obtained in the course of the operation, the necessity for which is sufficiently demonstrable without its use. On the other hand, it is claimed by its advocates to be capable of giving very important information needed for the guidance of the operator.

The sympathies of the writer are with those who deprecate the routine use of the cystoscope in these cases.

Choice of Operation.—In operating for prostatic dysuria, the problem which the surgeon has to solve is not only to thoroughly remove the obstruction, but to do it without undue prolongation of manipulation and with as little loss of blood as possible, and with a minimum amount of injury to the urethra, bladder, rectum, and ejaculatory ducts, thereby lessening mortality and subsequent infirmities. At the present time three methods of attack present themselves for choice: 1. Through the bladder by means of a suprapubic section; 2. By the perineum through a limited longitudinal median incision carried into the capsule of the prostate. In both of these methods enucleation of prostatic masses is effected by finger-tip dissection unaided by sight; 3. By the perineum through a free transversely curved incision, through which the prostate is fully exposed, followed by systematic incision into its substance, and subsequent enucleations largely under the guidance of the eye.

In the first two methods named the amount of time required in the manipulation, in favorable cases, is distinctly less, and it is conceivable that in some cases this indication of quickness of execution may determine the choice. Cases characterized by massive gland hypertrophy are the most favorable for the transvesical method; those in which the hypertrophy is moderate lend themselves better to one of the perineal methods; those in which there is a marked fibrotic element in the prostatic change always require for their satisfactory management recourse to the most open method of attack possible. Cases in which a suprapubic opening has already been made for the removal of calculi or clots, or for bladder drainage, and in which a well-marked intravesical projecting mass is felt, will naturally invite attack through the bladder. And in the absence of any important indication to preserve the ejaculatory ducts, should be so treated. Cases with massive intravesical growth, and in which the use of a general anæsthetic is contraindicated,—as in certain renal and cardiac conditions,—but in which operation may still be justifiable under spinal cocainization, may better be attacked through the bladder. A hard fibrotic prostate should not be subjected to any form of prostatectomy under such conditions; but in such a complex of conditions the Bottini method of galvanocautery incision would find its special field. In the great majority of cases, however, there will be nothing to prevent the surgeon from resorting to such method of procedure as in his judgment will best satisfy all the requirements of an ideal operation. In the earlier sections of this paper, the writer has attempted to critically examine the operative indications which prostatic dysuria presents. He will not attempt to again marshal them here, even in review, but will content himself with the statement of his conviction from their study that, as a rule, for the best fulfilment of all the operative indications, there is necessary the free exposure of the gland by suitable perineal incision; the exposed gland should be brought down as much as possible into the superficial operative field by the use of suitable tractors, and the removal of the obstructing masses should be carefully and systematically effected under the guidance of the eye as much as possible. There is surely nothing in the special conditions of the prostate to take its surgery out of the application of that tenet of general surgery which demands the adequate exposure of the affected part as the first step of any attack upon it. That the additional time which this method of procedure takes adds but little, if anything, to the hazards of the operation, experience has already fully demonstrated (*vide* the mortality tables given on page 566), while it will add very much to the definiteness and certainty of the result.

Choice of Anæsthetic.—In general, chloroform is to be preferred as the general anæsthetic of the aged, on account of the less tendency to bronchial irritation and pulmonary congestion which follows its use. In cases in which even chloroform is manifestly extra-hazardous, it has been shown by Wiener that operation through the bladder may be done with safety under nitrous-oxide gas anæsthesia. Young * has reported ten cases in which perineal prostatectomy has been readily effected by the use of spinal cocainization, without any unpleasant sequelæ in any case, and Tinker * has demonstrated in two instances the feasibility of removing a hypertrophied prostate under local anæsthesia by tissue infiltration with solution of eucain and adrenalin.

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* Young. Perineal Prostatectomy. Journal of the American Medical Association, February 4, 1905.

TECHNIQUE OF THE PERINEAL OPERATION RECOMMENDED.—*a. Before the Incision.*—The patient is placed on a firm table in an exaggerated lithotomy position, the pelvis elevated, by sand bags or other special supports, to a degree that will bring the plane of the perineum as near horizontal as possible (Fig. 2). The rectum should have been emptied by an enema administered at least eight hours before the hour of operation, and now should require no attention. The scrotum, perineum, and adjacent thigh surfaces having previously been shaved and cleaned, should again be scrubbed and disinfected after the patient has been placed in position. A full-sized sound, No. 26–30 (French), should now be introduced through the urethra into the bladder and held by an assistant. Should any strictures in the anterior urethra be detected, they should be freely divided by urethrotome at this time. The sound in the urethra should not be made to project into the perineum, but should be raised so as to bring the membranous urethra as close as possible to the pubic arch and increase the distance between the urethra and the rectum (Proust).

b. The Primary Incision.—A curved incision through skin and superficial fascia is then made, distant an inch to an inch and a half in front of the anus and extending from ischium to ischium (Fig. 3).

c. The Exposure of the Recto-urethral Muscle.—This is a step of the highest importance, since this semi-aponeurotic muscle is the only real barrier in the way of free access to the

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* Tinker. Bloodless Perineal Prostatectomy under Local Anæsthesia. Journal of the American Medical Association, February 11, 1905, p. 471.

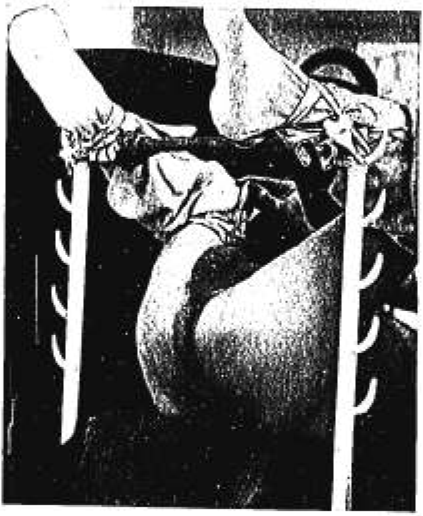

FIG. 2.—Perineal prostatectomy. Patient in position for operation; staff in urethra held by assistant.

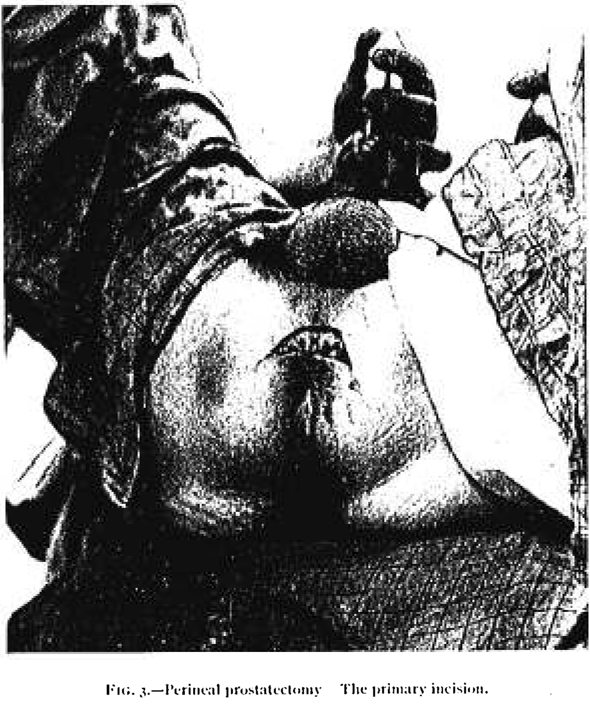

FIG. 3.—Perineal prostatectomy The primary incision.

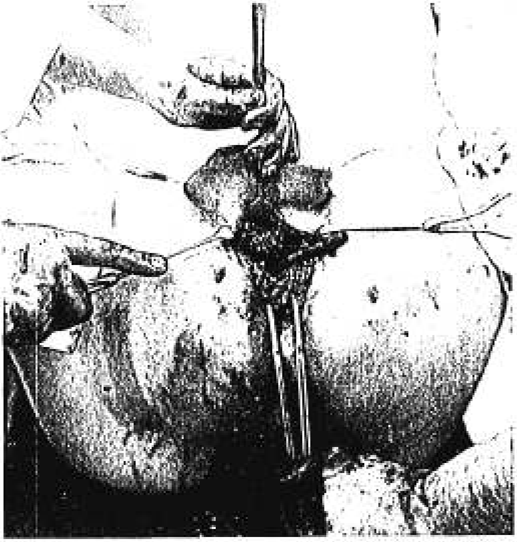

FIG. 4.—Perineal prostatectomy. Delimitation of the bulb. (Photograph taken after removal of prostate, and the bulb permitted to drop back into place.)

periprostatic space. By its prolongation anteriorly the membranous urethra is swung from the pubic arch and its main portion, inserted into the anterior wall of the rectum above the internal sphincter, draws that portion of the rectum forward towards the urethra; in many instances in the aged the bulb is so enlarged (Fig. 1) that its backward projection is sufficient to cover entirely the space between rectum and urethra. The delimitation of the bulb is quickly accomplished after the division of the ano-bulbar raphe (Fig. 4). The bulb is then drawn forward in the grasp of a forceps until the membranous urethra is identified, distended as it is by the sound that fills it, but obscured by the recto-urethralis muscle. As the bulb is drawn forward the posterior edge of the transverse perineal muscle, on each side, is made tense and identifiable, and is a guide to the location of the artery of the bulb which is to be avoided. Just behind these transverse perineal fibres and vessels to the outer side of the urethra is a weak spot in the deep perineal fascia through which the tip of the finger can readily be made to bore, and to penetrate alongside the membranous urethra even back to the prostate. The finger-tips thrust in at this point pressing outward and backward towards the ichia quickly opens up these lateral spaces, into which suitable retractors are at once placed.

d. The Exposure of the Prostate.—The detachment of the recto-urethral fibres from the face of the membranous urethra is now readily effected, guided by the eye and aided by snips of the scissors or touches of the knife, but for the most part bluntly done by the finger. The rectum, now freed from its anterior attachments, is pushed backward; the connective tissue about the urethra and the face of the prostate is readily detached and rolled back by the finger-tips until the rectoprostatic interspace is penetrated as deeply as the conditions may require. A broad, blunt-edged retractor is adjusted so as to keep the rectum drawn back from the field, and, with the assistance of the lateral retractors already placed, the prostate is fully exposed. The description of the operative steps thus far may have seemed long, but the work itself advances steadily from point to point, and does not take much time for its accomplishment. (In the experience of the writer from ten to twelve minutes.)

e. The Downward Traction of the Prostate.—The prostate may be forced down towards the perineal surface by strong counterpressure from above the pubis, or it may be seized by suitable traction forceps introduced through the perineal wound and dragged down so as to be more accessible to attack; but greater advantages are possessed by forms of tractors which are introduced through the urethra into the bladder and by expansion or unfolding of intravesical blades furnish a mechanism whereby strong traction can be exercised upon the base of the bladder. Such are the tractors of Lydston, Syms, de Pezzer, and Young. Of these I have used with great satisfaction the model devised by Young. The time for its introduction is after the prostate has been fully exposed as described in the preceding paragraph. The membranous urethra is also fully exposed in the wound, distended by the sound, which now serves as a guide by which to incise the prostatic urethra, beginning at the apex of the gland and extending the incision as far backward as may be necessary to give room for the ready introduction of the rather blunt and clumsy beak of the tractor. After the incision has been made, the sound is withdrawn, the edges of the incision are held apart by tenacula or loops of thread that have been inserted into them, and the tractor passed through the prostatic urethra into the bladder. Its blades are then rotated so as to form two divergent wings within the bladder, by means of which later traction is made as required with a minimum of injury to the mucous membrane of the bladder. Such an instrument is more than a tractor; it is practically an elongated finger by means of which the operator can appreciate to a notable degree the conditions within the bladder, can make such graduated counterpressure as he may require to facilitate the progress of his enucleation, and can gauge the extent and progress of his work at any time. It contributes to a notable degree to the positiveness and accuracy of the work.

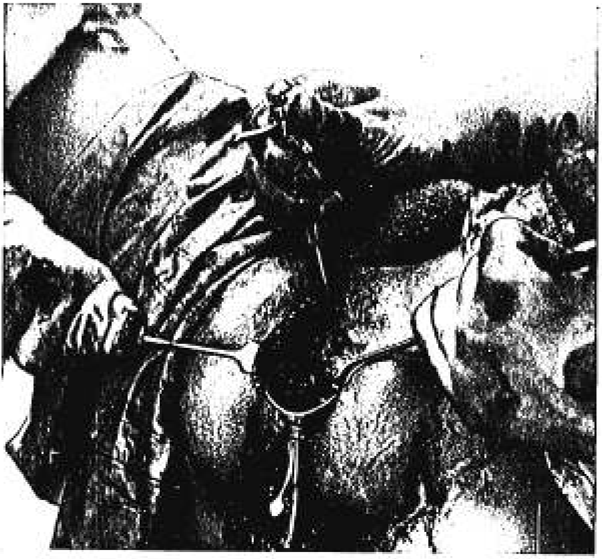

FIG. 5.—Perineal prostatectomy. The prostate exposed; the tractor introduced and used to pull down the prostate; the primary incision in the capsule made.

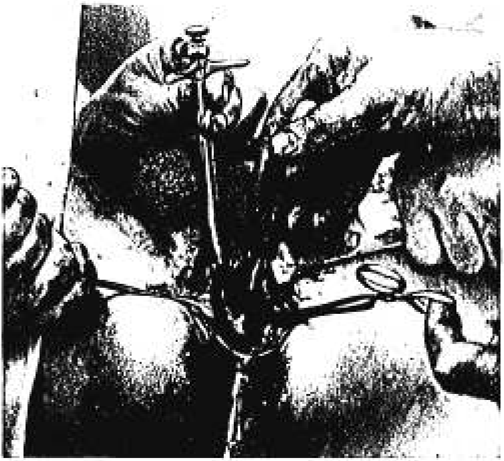

FIG. 6.—Perineal prostatectomy. Enucleation of hypertrophied mass by blunt dissector.

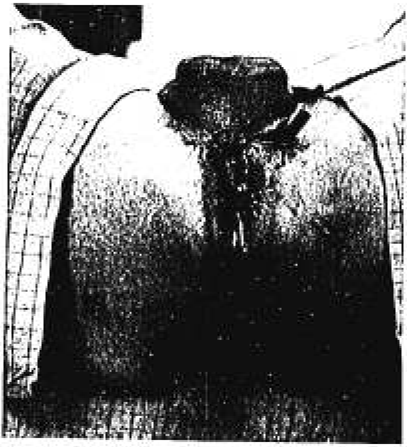

FIG. 7.—Perineal prostatectomy. Wound sutured; bladder drain-tube placed.

f. Enucleation of the Hypertrophied Masses.—To effect this, I have found the technique described by Young very satisfactory. The prostate having been brought into good exposure, two free longitudinal incisions are then made through the capsule to a depth of about one and a half centimetres into the substance of the gland (Fig. 5), one on either side of the urethra. These are about one and a half centimetres apart in front and diverge slightly as they pass backward. The bridge of tissue that lies between them supports the urethra and contains the ejaculatory ducts. The outer edge of one of the wounds in the capsule is then seized with tissue forceps to steady it, and a blunt dissector entered in the line of cleavage that presents; with this the mass in the lateral lobe is readily enucleated anteriorly and externally (Fig. 6); the partially turned-out mass can now be seized with a suitable traction forceps and pulled upon to facilitate the separation of the deeper portion. The finger-tip may now be substituted for the blunt dissector as the enucleation extends into a region beyond the control of the eye. As that portion of the mass is reached which lies adjacent to the urethra, it should be separated with especial care to avoid tearing the urethra; the blunt dissector, the touch of the knife point, or a snip of the scissors may be required to divide the bands of tissue that may unite it to the urethral wall. The other lateral mass is then removed in the same manner. The presence of a median lobe is then readily determined by the conjoined manipulation of the finger-tip in the lateral prostatic cavities and the tractor in the bladder, and if present may usually be brought down into reach of the enucleating finger with marked ease by the pressure of the suitably placed intravesical blades of the tractor, and is freed and turned out through one of these lateral spaces, without injury to the bladder and in many cases, it is believed, without injury to the ejaculatory ducts. If palpation reveals now the further presence of a mass of hypertrophy in the posterior median bridge yet left, it can be exposed by transverse incision and enucleated, but probably such removal would entail cutting across the ejaculatory ducts. In the relatively small, hard, fibrotic prostates, the enucleation of great masses is not possible; some small glandular nodules may be present and readily turned out, but for the removal of the greater part of each lobe there is required a piecemeal excision by traction forceps and scissors.

The operator will be able to determine with great facility and accuracy the thickness of the tissue intervening between the depth of his dissection and the cavity of the bladder by the tip of his finger in the wound pressed against the broad blades of the tractor in the bladder. By the tractor also, used as a searcher, for which its shape well fits it, the question of the presence of calculi in the bladder will be determined. If a calculus is present, the prostatic urethra must be dilated sufficiently to permit of the introduction of the instruments required for its removal.

In cases of fibrotic contracture of the internal meatus, a free incision of the floor of the prostatic urethra through the ring at the internal meatus into the bladder should be made.

If a pedunculated median intravesical growth is found that cannot readily be everted into a lateral cavity, the prostatic urethra should be incised backward sufficiently to allow of the tumor being caught and brought out into the urethral wound and cut away.

g. The Primary Wound Dressing.—The tractor having been withdrawn, its blades having been first closed, the bladder should be well washed out to free it of any clots that may have formed in it. In most of my cases I have then introduced into the bladder a large-sized—No. 30—soft-rubber catheter throughout the urethra from the meatus externus and tied it in; this to remain for a week as a mould for the more surely obtaining the best reconstitution of the urethra. Around this I have brought the periurethral tissues by several points of chromic-gut suture. This catheter having been removed on the seventh day, a No. 26 sound was passed on the third day after its removal, and twice a week for the ensuing two weeks, after which further instrumentation was suspended. In cases complicated by much cystitis, such irrigations and intravesical medication as the case demanded were readily given through this catheter á demeure. In addition, a tampon of iodoform gauze and a short tube drain of rubber were laid in the perineal wound to the deepest part of the wound cavity. These were removed on the fifth day, and the wound cavity well irrigated, and then left to contract. The lateral wound spaces were brought together by some points of deeply placed chromic suture, and the external wound closed over about one-half its extent by several points of silkworm-gut suture. The results following this method of after-treatment have been highly satisfactory. The perineal wounds have rapidly closed; no permanent fistulæ, other than the one case of recto-urethral fistula already noted, have remained; the ability of the bladder to retain and expel at due intervals its contents has early been regained, with the reservation as to some temporary defects in retention described in a preceding page, and no stricture of the urethra, that I am aware of, has developed. In my last three cases, Cases XXI, XXII, and XXIII, however, instead of the catheter á demeure, I have simply placed a large rubber drain tube through the opening in the prostatic urethra into the bladder and secured its outer end at one angle of the external perineal wound (Fig. 7) by a point of suture, at the same time laying an iodoform gauze tampon into the depth of the perineal wound. The tampon was removed on the fifth day, the bladder drain-tube on the seventh day, when, after an irrigation of the bladder and urethra, a sound was passed through meatus and urethra into bladder. The later history of these cases has been quite as favorable as those that preceded them, and, as the method is more simple and less irksome to the patient than the preceding one, I am inclined to regard it as to be preferred, unless further experience should show it to be attended with greater liability to the development of distortions or strictures of the urethra.

AFTER-TREATMENT.—*a. Local.*—The local cares are very simple, being those of any drained wound, plus the provisions for carrying away the urine. To the retained catheter of the bladder perineal tube drain is attached a sufficient length of rubber tubing to reach a bottle hung at the side of the bed, which receives the urine conveyed through the tube. An absorbent compress to the perineal wound, retained by a T-bandage, completes the dressing. The removal of the gauze tampon on the fifth day, and of the drain or catheter on the seventh day, and the opening of the urethra by sound have already been discussed. Instrumentation applied to the urethra or the wound cavity should be avoided as far as possible, but such a minimum careful use of the sound as is required to assure the surgeon of the continuity and full patency of the urethral canal ought not to be omitted.

The treatment of the complicating cystitis will receive such attention as the condition of the particular patient may determine. In none of my own cases has there seemed to be any indication for continuous irrigation of the bladder after operation.

b. General.—The aged men who are subjected to perineal prostatectomy bear the operation, as a rule, surprisingly well, even though the manipulations seem to be somewhat prolonged. This I take it is due to the little loss of blood that attends the work, and to the elevated position of the pelvis and lower limbs which is maintained during its progress. In the feebler patients, however, a later depression has in some cases manifested itself after their return to bed. This, however, soon responds to the use of heat, hypodermoclysis, and adrenalin.

Renal insufficiency is the chief other contingency to be provided against in the immediate after-care. The best preventive of this has already been supplied in the preoperative copious libations of water. These should be continued after the operation, and in the case of the appearance of deficient amount of renal secretion should be supplemented by rectal enemata, hypodermoclysis, and in the event of its continuance, despite these means, by direct intravenous saline infusion to the extent of 1200 to 1600 cubic centimetres.

RESULTS.—Up to date (February 21, 1905), the writer has removed the prostate gland in twenty-three patients, the first operation having been done in September, 1902. In this case a restricted median incision was made, and the enucleation was conducted by the sense of touch alone. The patient recovered, was relieved from his dysuria, and has led an active life since; but as a surgical operative procedure the method was so unsatisfactory to his sense of good work that in all subsequent cases he has preferred to make use of sufficiently free external incisions to give him an adequate view of the field of work and better control of its various steps. In one case, No. XIX of the series, the suprapubic transvesical method was resorted to. It was in a case of a greatly enfeebled patient, fifty-seven years of age, with a massive intravesical projection of the hypertrophied prostate, multiple calculi, and a high grade of cystitis. A total enucleation of the whole prostate (Fig. 1, p. 484) was quickly effected after the method of Fuller, and an uncomplicated recovery followed. The remaining twenty-one cases have been subjected to the method of perineal attack already described.

The ages of the patients were as follows:

Over 80 years, 1
Between 75 and 80, 2
Between 70 and 75, 8
Between 65 and 70, 6
Between 60 and 65, 2
Between 55 and 60, 4

Mortality.—Two patients died as the result of the operation,—one, aged seventy-two years, from pulmonary congestion within twenty-four hours after operation; one, aged fifty-seven years, at the end of seven days, from uræmia due to progressive renal insufficiency.

Relief of Obstruction.—Complete * and permanent in all cases except in Case VI, a man, fifty-nine years of age, with an atonic bladder and a contracted fibrotic condition of the internal meatus associated with a moderately enlarged

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* Further examination of these patients might require some qualification of this statement as to its absoluteness in some cases by revealing a mild degree of residual urine. Subjectively, however, from the standpoint of the patient's sensations, it is correct, for they feel that they now evacuate their bladders as well as ever.

dense fibrotic prostate. When operated, he had a residual urine of thirty-two ounces. Six months later he still had eight ounces of residual urine, and was using a catheter twice daily.

FISTULÆ.—A persistent recto-urethral fistula remained in Case XI. This has already been remarked upon (see p. 571). In Case VII, a man of seventy-eight years of age, who was an exceedingly intractable patient and would not permit any bladder drain to be retained in the wound, was finally discharged from hospital with perineal wound soundly healed and with normal urination per urethram. Six months later there developed a perineal abscess followed by a perineal urinary fistula, which was successfully operated upon by Dr. J. B. Roberts, of Philadelphia. In all other cases sound and complete wound healing has followed.

EPIDIDYMITIS.—A transient epididymitis occurred in the after-course of the case in six instances. In two cases this epididymal infection terminated in suppuration (see p. 570).

CONTINENCE OF URINE.—The control of the bladder sphincters so as to prevent the involuntary escape of urine has been regained in great measure within from ten to twenty days after operation. Some weakness of the sphincters, resulting in slight leakage, if the patient cannot at once respond to a sense of need to empty the bladder, has continued to manifest itself for some months in some cases, but has gradually given way to normal control in most of the cases. In at least two instances, however, this sphincter weakness has in some degree continued permanently, but has entailed an infirmity so greatly less than the pre-existing dysuria that the patients bear it cheerfully and gratefully.

CONCLUSION.—These results have given me the highest satisfaction. They have fully equalled the expectations which the representations of other surgeons as to their experience in the work had created, and have definitely settled in my mind the conviction that at last surgery had to offer to the unfortunate and aged "prostatic" a fairly safe and reasonably certain means of relief. In the light of present experience and after as full a consideration of the anatomical and pathological conditions involved as I have been able to make, I am inclined to the conclusion that, as a rule, for the removal of the hypertrophied prostate, the method of free curved transverse perineal incision, with full exposure of the gland in the wound of operation, is to be preferred.